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THE WHITE HOUSE  
WASHINGTON



DOE REVIEW  
COMPLETED

April 16, 1956

*W.G. Jackson*

MEMORANDUM FOR: Director of Central Intelligence

SUBJECT: Application of Nuclear Energy to Providing  
Water in the Near East

For your information there is attached a copy of the memorandum which Admiral Strauss sent Mr. William H. Jackson regarding the possibility of applying nuclear energy to the providing of fresh water in the Near East. He does not think that the feasibility or cost could be estimated with sufficient accuracy to make the project one which should be proposed at the present time.

*W.G. Jackson*  
Wayne G. Jackson

Attachment

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(EXECUTIVE REGISTRY FILE *White House*)

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United States  
Atomic Energy Commission  
Washington, D.C.

April 11, 1956

Memorandum for Mr. William H. Jackson  
Special Assistant to the President

Dear Bill:

I have given considerable thought to the project proposed by your unnamed correspondent, with a view to providing fresh water in the Near East. At the present time the proposal is impractical. It seems to have been based upon a communication to the McKinney "Panel" from one of the technicians at Los Alamos in which statements were made with respect to a breeder reactor to provide heat for the distillation of sea water. This type of reactor has never gotten as far even as design stage and the costs stated do not stand up under examination. Based upon our experience with other reactors there are some years of research and development ahead before any calculations can be firmed up.

As you know, the Department of the Interior has a task force working on the de-salting of sea water which is of specific interest to California, Arizona, New Mexico, and other Western States. The Atomic Energy Commission collaborates in these studies (see Third Annual Report of the Secretary of the Interior on Saline Water Conversion, January 1955). There are other methods besides distillation and the one which seems presently the most promising is that developed under the patronage of the late Dr. Karl Compton. Work is being done on it by a small company called "Ionics, Inc.", backed by our mutual friend, Georges Doriot. This process produces fresh water from brackish water by the principle of ion-exchange through a resinous membrane. On a pilot plant basis this process looks encouraging and the consumption of energy not too excessive, but it is my understanding that they have, thus far, been unable to develop a diaphragm that will stand up for any length of time.

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Mr. William H. Jackson

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Because of the immediate seriousness of the situation in the Near East and the long-range nature of this project, it does not seem to me that we can hold out any promises now of sufficient validity to bring the warring groups together but I am having the subject pursued with vigor here to see whether, if a period of truce ensues, this may not become one of the carrots to tie on the end of the stick.

/s/ Lewis  
Lewis L. Strauss

at a - ER8-0673  
*[Signature]*

22 March 1956

Memorandum Re International Water Authority for the Middle East

*f broad*

As a means of relaxing tensions in the Middle East, it would be useful if some major projects could be developed which would be on a regional rather than a national basis. The Middle East has a plethora of oil and a shortage of water, or at least water that is at present harnessed and properly used. There are a series of major projects -- the Aswan Dam, the Jordan Valley, the Tigris Euphrates, etc., etc. Some consideration ~~has~~ also been given to the establishment, say in the Gaza Strip, of nuclear reactors which would make fresh water out of salt. While the development of this principle is still in the early planning stage, it is clear that if it is to be done it has to be on a very large scale in order to get the costs within any reasonable limits.

It is suggested that study be given to the constitution, possibly under UN auspices, of a Middle East International Water Authority which would devote itself to all such projects, or where there was already a national project, would supplement the national effort, or bi-national or tri-national as the case might be. It is conceivable that one might call upon those countries, Saudi Arabia, Iraq, Kuwait, etc., for a contribution to this authority, say five per cent of all production, and possibly seek some comparable contribution from the foreign operating companies, chiefly British and American. This would be supplemented by grants from UN members, particularly U.S., Britain, etc., and the International Bank. We would then be in a position to call upon the Soviet for an appropriate contribution from them and this would test out their willingness to participate in a peaceful and highly important economic development project.

The outlines of this scheme are obviously very vague and are merely presented as a basis for examining whether there is any reality to the project. It might at least serve to put to the test the real intentions of countries like Egypt and Israel; as well as the Soviet Union.

Allen W. Dulles  
Director

March 20, 1956

Application of Nuclear Energy to Providing Water in the Near East

Thesis

The present situation in the Near East is one in which the Arabs and Israelis glare at each other across somewhat artificial boundaries, concentrating their attention on building up their military strength in apparent anticipation that something will touch off hostilities between them. Their state of mind is such that efforts to urge moderation or accommodation are likely to fall on deaf ears. If it were possible to attract their attention to some other subject, the tension between them might be lessened, particularly if it were a project requiring joint action. Obviously one of the most important preoccupations in the countries in question is water. Some of the most critical issues in the area which might lead to hostilities involve water, e.g., the Banat Yaqub and the Jordan-Israel boundary. The Jordan Valley Authority project, which calls for a joint development of the water of the Jordan, is having rough going and there appears to be little prospect of its being agreed to by all concerned without a change in its nature. If some project could be developed which required a joint approach toward the providing of more water for the area, there is at least the possibility that the countries concerned might respond.

The President has announced that the AEC will make available significant quantities of nuclear fuel for overseas developments. The McKinney "Panel on the Impact of the Peaceful Uses of Atomic Energy" has recommended that the AEC provide the focal point for the development of specific projects abroad for the peaceful use of atomic energy (chapter 9 of the Panel Report dated January 1956). It is understood that the AEC is sympathetic to this recommendation.

The published background material for the report of the McKinney Panel on pages 311-313 contains a discussion of the distillation of sea water by nuclear energy and indicates that it appears to be theoretically possible to build a reactor which could produce, by distillation, as much as a billion gallons of fresh water a day at a cost (including amortization, replacement and maintenance, operation and fuel) of between ten and fifteen cents per thousand gallons.

This might well be a bearable cost for irrigation water in the Near East. The project might cost between \$600 and \$800 million. There is no breakdown in the estimate of how much of the cost would be local labor costs and how much would be for equipment. It is at least possible that such a distillation project might require ancillary equipment which would be operated by oil in order to make the process efficient.

As an alternative to the process of distilling salt water, there is the possibility that large quantities of underground fresh water might be found which could be pumped for irrigation purposes. Furthermore, there is also the possibility that a method of filtration could be developed for converting salt water into water usable for irrigation. The technical and construction problems of a project to produce and distribute water have not even started to be worked out. They do not appear, however, to be beyond the realm of possibility.

Proposal

It is therefore recommended that consideration be given to the following proposal: The President would announce that, as a follow-up to the announcement on the availability of nuclear fuel, he was inviting technical representatives of Egypt, Jordan, Syria, Lebanon, Saudi Arabia and Israel to form, with United States technicians, the necessary study groups to investigate the possibility of applying nuclear energy to supplying massive amounts of water for irrigation in the Near East. Scientists from most of these countries have already been trained in the atomic energy courses in the United States and their names are known. The technicians would have to study not only the application of nuclear energy to the production of water usable for irrigation, but also the problems involved in the transportation and distribution of water, which would include questions of location, engineering surveys, etc. The announcement would be made in such terms as to make it clear that only an investigation of feasibility was involved. The participation of other friendly countries having nuclear capabilities, e.g., the British and Canadians, might be invited. Thought should be given to the possibility of also inviting the Soviets to participate. The announcement would make it clear that the project would be taken over by the UN-affiliated international atomic energy agency when

it got into operation. Careful thought would have to be given to the question of whether approaches would be made to the countries involved prior to public announcement. The Arab countries might find it more difficult to refuse to cooperate with Israel if faced by a public offer.

The next step would be for the Atomic Energy Commission to set up a technical group to study the possibility of building appropriate reactors. In this they would need the assistance of the Department of the Interior which has an Office of Saline Water set up pursuant to the Saline Water Act of 1952. At the same time engineering studies would have to be undertaken in the Near East to look into such questions as possible sources of fresh water, transportation of water, the location of a plant, (e.g. the Gaza Strip), etc. United States assistance in such studies might be carried out under the Technical Assistance Program.

#### Comments

The feasibility of this idea has been discussed in a most informal way with Mr. Herbert I. Miller, who was Executive Director of the staff of the McKinney Panel. He has also discussed it very briefly with a Mr. Davis of the Reactor Division of AEC. They do not feel that the project is so improbable as to make it not worth investigating. The Office of Saline Water of the Department of Interior has produced reports (the latest dated January 3, 1956) on Saline Water Conversion which contain a good deal of material on the feasibility of converting sea water. The cooperation of this office would be desirable. A good deal of work which would have a bearing on this project has been done in connection with attempts to apply solar energy. A great deal of practical experience on the degree of salinity which is tolerable for agriculture must have been developed by the Dutch and Italians in the course of their putting back into production lands which were flooded by the sea at the end of the last war.

#### Recommendations

It is recommended that this matter be taken up very informally with the Chairman of the AEC and that further preliminary elaboration be undertaken by people who are technically equipped to understand the problems involved.

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THE WHITE HOUSE  
WASHINGTON

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22 Mar.

DCI -

This is a copy of the  
paper Bill gave Adm.  
Strauss, saying it was  
just a brainstorm of a  
member of his staff

W.B. Jackson